

CLUTCH

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CLUTCH

The clutch is of the single dry disk type. The clutch assembly consists of the clutch disk assembly, clutch cover and pressure plate assembly, and clutch release mechanism.

The clutch operating mechanism is a hydraulic type.

6-A. CLUTCH PEDAL ADJUSTMENT

The free travel of the clutch pedal should be between 20 to 30 mm (0.8 to 1.2 in). To adjust the free travel, loosen the lock nut and turn the push rod until proper adjustment is made.

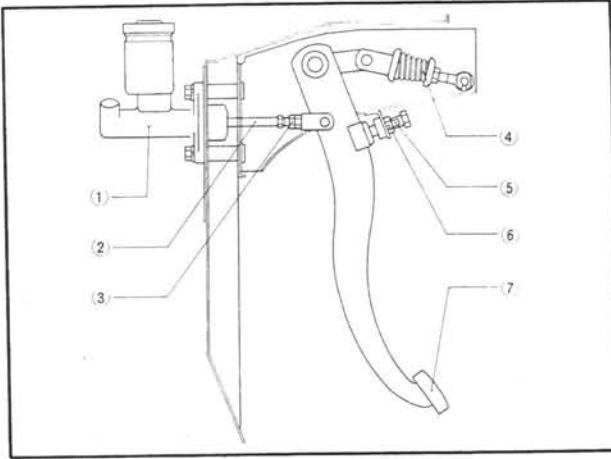


Fig. 6-1 Clutch pedal adjustment

- | | |
|--------------------|-----------------|
| 1. Master cylinder | 5. Stopper bolt |
| 2. Push rod | 6. Lock nut |
| 3. Lock nut | 7. Clutch pedal |
| 4. Return spring | |

6-B. RELEASE FORK ADJUSTMENT

There should always be a safe clearance of 1.5 mm (0.06 in) between the release bearing and the diaphragm spring. This clearance is essential to disengage the release bearing and to prevent unnecessary wear and possible slippage. This clearance is obtained when the free play of the release fork is adjusted to 3.0 mm (0.12 in).

To adjust remove the return spring, loosen the lock nut, and turn the adjusting nut until the correct play is obtained.

After adjusting, securely tighten the lock nut and hook the return spring.

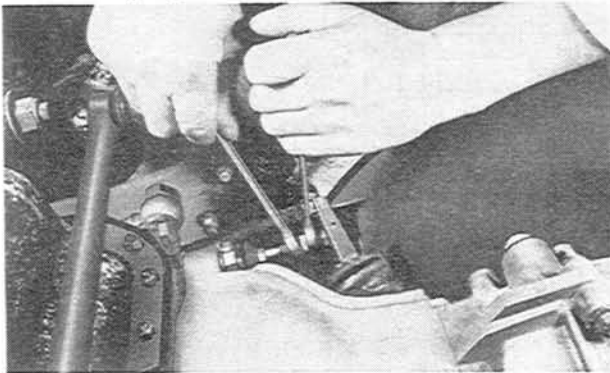


Fig. 6-2

6-C. CLUTCH REMOVAL

To remove the clutch from the vehicle, proceed as follows:

1. Remove the transmission as detailed in Par. 7-A.
2. Install the **ring gear brake** (49 0820 060).
3. Loosen the bolts holding the clutch cover assembly to the flywheel and remove the clutch cover assembly and the clutch disk.
4. Loosen the nut that attaches the flywheel to the eccentric shaft. Remove the flywheel.
5. Remove the return spring for the clutch release bearing and slide off the release bearing.
6. Pull the release fork outward until the retaining spring of the fork releases itself from the pivot pin. Remove the fork from the clutch housing.

6-D. CLUTCH INSPECTION**6-D-1. Checking the Release Bearing**

Check the release bearing by turning the bearing race by hand. Replace it if any abnormal noise or roughness is felt when turning.

Examine the front cover of the transmission carefully to be certain there are no burrs on the outer surface of the front cover which pilots the release bearing. Check the release fork for crack or bend.



Fig. 6-3 Release bearing

Note: The release bearing is packed with lubricant which is intended to last the whole life time of the bearing. Therefore, the bearing must not be washed in gasoline or any other solvent.

6-D-2. Checking the Pressure Plate Assembly

Check the contact surfaces of the pressure plate with the clutch facing for wear, damage or warpage. If it is slight, correct it by lapping with compound or by turning a lathe. But if severe, replace with a new one.

Check the diaphragm spring and cover and if any wear or damage is found, replace the pressure plate assembly.

6-D-3. Checking the Clutch Disk

Inspect the clutch disk for warpage with a dial indicator or a feeler gauge, as shown in Fig. 6-4.

If it is more than 1.0 mm (0.0394 in), replace with a new one.



Fig. 6-4 Checking clutch disk

Replace excessive worn facing as it will cause slippage, or scores the pressure plate and flywheel due to the projected heads of rivets.

If oil is evident on the facing, clean or replace the facing and eliminate the cause of oil leakage.

Make certain that the clutch disk slides easily on the main drive shaft without any excessive play.

If the play exceeds 0.3 mm (0.012 in), replace the clutch disk or the main drive shaft.

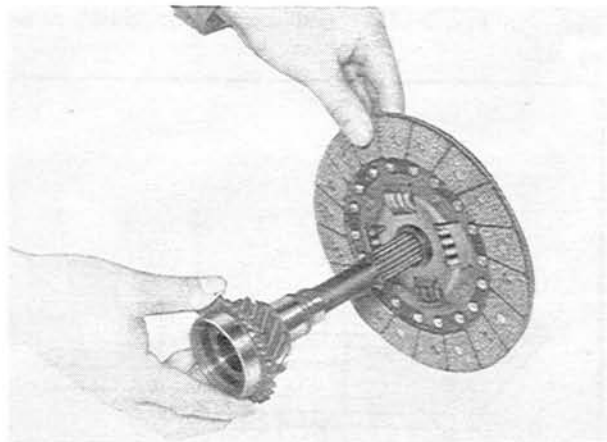


Fig. 6-5 Checking spline fit of clutch disk

6-D-4. Flywheel Inspection

Inspect the contact surface of the flywheel with the clutch facing for burnt surface, scored surface of rivet grooves.

If it is slight, it can be reconditioned by grinding in a lathe. If the damage is deep, the flywheel should be replaced.

Check the ring gear teeth and replace if the ring gear teeth are broken, cracked or seriously burred.

6-D-5. Ring Gear Replacement

1. Heat the old ring gear and remove it from the flywheel.

2. Heat the new ring gear evenly 250 to 300°C (480 to 570°F).

3. Place the ring gear on the cold flywheel, making sure that the chamfer on the teeth is faced to the engine.

4. Allow the ring gear to cool slowly to shrink it onto the flywheel.

6-D-6. Inspecting the Needle Roller Bearing and Oil Seal

Check the needle roller bearing and oil seal at the rear end of the eccentric shaft. Then insert the pilot part of the main drive shaft and check for smooth operation and proper clearance. If the bearing is loosen or runs rough, it should be replaced.

Check for wear and damage of the oil seal lip. If traces of oil leakage are found, replace the oil seal.

6-E. CLUTCH ASSEMBLY

1. Install the flywheel onto the rear end of the eccentric shaft through the key. Place the lockwasher in its place and install the lock nut.

2. Use a **ring gear brake** (49 0820 060) and tighten the lock nut to 45 m-kp (320 ft-lb).

3. Bend the lockwasher to prevent loosening.

4. Hold the clutch disk and pressure plate assembly in mounting position. Then, insert a **clutch disk centering tool** (49 0813 310) through the spline of the disk and into the pilot bearing. If a tool is not available, use a spare main drive shaft.

5. Match the "O" mark on the pressure plate with the reamer hole of the flywheel and fit the securing bolts.

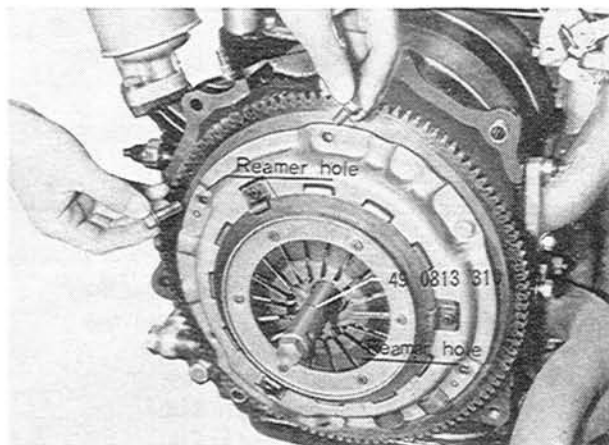


Fig. 6-6 Installing pressure plate assembly

6. Tighten the bolts to 2.0 m-kp (15 ft-lb).

7. Remove the centering tool and ring gear brake.

8. Apply grease to the pivot pin and drive the release fork inward so that the retaining spring of the fork fits to the pivot pin. Install the release bearing and hook the return spring. After installing, check to ensure that the release bearing slides smoothly back and forth on the retainer when operating the release fork.

9. Install the transmission. Care should be taken in order not to bend the clutch disk by allowing the transmission to hang.

6-F. CLUTCH MASTER CYLINDER

6-F-1. Removing the Clutch Master Cylinder

If it becomes necessary to remove the clutch master cylinder for repair or overhaul, proceed as follows:

1. Disconnect the fluid pipe at the clutch master cylinder outlet.
2. Remove the nuts that attach the clutch master cylinder to the dash panel.
3. Pull the clutch master cylinder straight out and away from the dash panel.

6-F-2. Disassembling the Clutch Master Cylinder

The disassembling procedures of the master cylinder after removing are as follows:

1. Clean the outside of the clutch master cylinder thoroughly and drain the brake fluid.
2. Remove the reservoir tank from the cylinder.
3. Remove the dust boot from the cylinder.
4. Remove the piston stop wire with a screwdriver and remove the stop washer.
5. Remove the piston, piston cup and return spring from the cylinder.

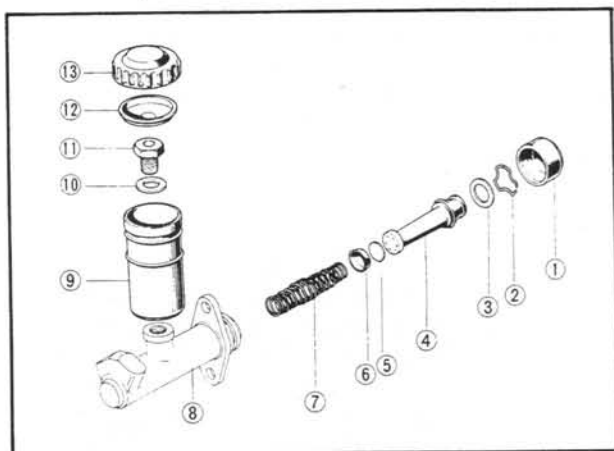


Fig. 6-7 Clutch master cylinder

- | | |
|---------------------|------------------|
| 1. Boot | 8. Cylinder body |
| 2. Stop wire | 9. Reserve tank |
| 3. Stop washer | 10. Washer |
| 4. Piston & 2nd cup | 11. Plug |
| 5. Spacer | 12. Baffle |
| 6. Primary cup | 13. Cap |
| 7. Piston spring | |

6-F-3. Checking the Clutch Master Cylinder

1. Wash the parts in clean alcohol or brake fluid. Never use gasoline or kerosene.
2. Check the piston cup and replace if they are damaged, worn, softened or swelled.
3. Examine the cylinder bore and piston for wear, roughness or scoring.
4. Check the clearance between the cylinder bore and the piston. If it is more than 0.15 mm (0.006 in), replace the cylinder or piston.
5. Ensure that the compensating port on the cylinder is open.

6-F-4. Assembling the Clutch Master Cylinder

1. Dip the piston and cups in clean brake fluid.
2. Install the reservoir tank.
3. Insert the return spring into the cylinder.
4. Install the primary piston cup so that the flat side of the cup faces the piston.

5. Fit the secondary cup onto the piston and install them in the cylinder.
6. Install the stop washer and stop wire.
7. Fill reservoir half with brake fluid and operate the piston with a screwdriver until the fluid is ejected at the outlet.
8. Install the dust boot to the cylinder.

6-F-5. Installing the Clutch Master Cylinder

1. Install the clutch master cylinder assembly onto the dash panel and tighten the nuts.
2. Connect the fluid pipe to the cylinder.
3. Fill with brake fluid and bleed the clutch hydraulic system.

6-G. CLUTCH RELEASE CYLINDER

6-G-1. Removing the Clutch Release Cylinder

1. Disconnect the flexible pipe at the clutch release cylinder.
2. Unhook the release fork return spring.
3. Remove the bolts attaching the cylinder to the clutch housing. Remove the release cylinder.

6-G-2. Checking the Clutch Release Cylinder

Refer to Par. 6-F-3 and inspect the clutch release cylinder.

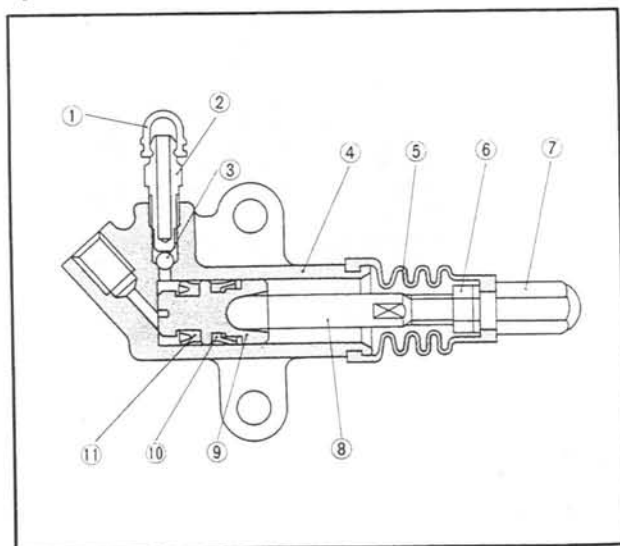


Fig. 6-8 Clutch release cylinder

- | | |
|------------------|-------------------|
| 1. Cap | 7. Adjust screw |
| 2. Bleeder valve | 8. Release rod |
| 3. Steel ball | 9. Piston |
| 4. Cylinder body | 10. Secondary cup |
| 5. Boot | 11. Primary cup |
| 6. Lock nut | |

6-G-3. Assembling the Clutch Release Cylinder

1. Fit the cups to the piston and install them in the cylinder.
2. Install the dust boot on the end of the cylinder.
3. Install the steel ball and bleeder into the bleeder hole.
4. Install the clutch release rod.

6-G-4. Installing the Clutch Release Cylinder

1. Install the clutch release cylinder assembly to the clutch housing with two bolts.
2. Connect the flexible pipe.
3. Fill the reservoir of the master cylinder with brake fluid and bleed the system, as described in Par. 6-H.
4. Adjust the free play of the release fork, as described in Par. 6-B.
5. Hook the return spring.

6-H. AIR BLEEDING

The clutch hydraulic system must be bled whenever a fluid line has been disconnected or air enters the

system. To bleed the clutch system, remove the rubber cap from the bleeder valve and attach the bleeder tube and fixture of the bleeder screw. Place the end of the tube in a glass jar and submerge in brake pedal and allow it to return slowly. Continue this pumping action and watch the flow of fluid in the jar. When air bubbles cease to appear, close the bleeder valve. During bleeding the reservoir of the master cylinder must be kept filled with fluid at least 3/4 of its capacity. After the bleeding operation, remove the tube, fit the cap on the bleeder valve, fill the reservoir and fit the filler cap.

SPECIAL TOOLS

49 0820 060	Ring gear brake
49 0813 310	Clutch disk centering tool

